

ELECTRICAL DESIGN ANALYSIS

TRANSMITTER FACILITY

STATINTL

60 % REVIEW PRINT
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STATINTApproved For Polosco 2001/03/03 · CIA PDP78-06632A000300010001-1

Project	Transmitte			of	17	
Feature	Electrical Design Analysis	Designed	M.I.	Date 18	Jan	1968
Item	Design Analysis Summary	Checked		Date		

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covers Transmitter Building and Gate House including the installation of government furnished 200 kW diesel engine driven generator sets with switchgear; interior work including power, lighting, control, grounding system, fire alarm, and cutlets, conduit, terminal cabinet, cable tray and floor trench system for telephone, intercommunication and technical equipment wiring by others; and exterior work including extension to existing primary power distribution, protective lighting, secondary power service to Gate House and provisions of duct sleeves under roads and paved area for antenna cables by others.

II. DESIGN CRITERIA:

- a. Request for Proposal on Design, POOGM letter of 15 March 1966
 with the following attachments:

 STATINTL
 - 1. Using Agency Sketch Drawings:

No drawing number

Dwg. No. D5345-T/D-Ol, Interior Grounding

Dwg. No. D5020-T/D-Ol, Exterior Grounding

Dwg. No. D5341.02-T/F-Ol, Floor Plan

Dwg. No. D5345-T/CL-Ol, Plot Plan, Transmitter Site

Dwg. No. D5345-T/E-Ol, Bus Duct & Power Panel Locations

No drawing number Government Furnished Electrical

Equipment

- 2. Scope of Work.
- 3. POD Comments:on the Scope of Work, dated March 1966.
- Description and Analysis of Electrical System (System 5).
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Project	Transmitte		of 17
	Electrical Design Analysis	Designed M. I.	Date 18 Jan 1968
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- b. Scope of Work attached to and made a part of Contract No.
- c. Using Agency Information, Ref: POOGM letter of 9 April 1966 with the followings:
 - 1. T.M.C. Power Distribution, Inc. drawings for 200 KW engine generator set,

Dwg. No. 15554-C, Radiator Shroud & Guard
Dwg. No. 15342-C, Lockout for Shockmounts
Dwg. No. 15587-B, Mounting Detail
Dwg. No. 15549-B, Battery Charger Wiring Diagram
Dwg. No. 155751-B, Battery Charger 2412-52
Dwg. No. 15426-C, Standard Engine Wiring Harness
Dwg. No. 15520-D, Schematic
Dwg. No. 15770-D, Assembly Drawing

Dwg. No. 15416-D, Assembly Drawing

Dwg. No. 15589-D, Storage Battery (Ordnance)

Dwg. No. 17016-D, Wiring Diagram

Dwg. No. 15755-D, Cabinet & Door Layout

No drawing No. Point to Point Wiring Diagram

- Installation and Maintenance Manual,
 Granger Associates Model 747L antenna.
- Using Agency Sketch Drawings, same drawings listed in design criteria reference a.l. plus the followings;

Dwg. No. D5345-T/S-01, Heat Load

Dwg. No. D5345-T/S-02, Antenna Cable Tray System

Dwg. No. D5345-T/S-03, Transmitter/Exciter Cable Tray System

Dwg. No. D5345-T/S-O4, Signal Cable Tray System

Project	Transmi	ttei		of 17
		cal Design Analysis		
Item	Design	Analysis Summary	Checked	Date
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STATIN	∵ T∣ đ.	Additional Information, F	Ref: POOGM letter of 1	8 June 1966 with
Olyvina		the following	drawings.	
=	ž.			
		Dwg. No. D-208316, Syste	em No. 5 SWBD Arrangem	ent
		Dwg. No. C-208290, Load	Box Arrangement	
TATINTL		· · ·		
	e.	Review Comments for	or 30% completion of t	the design.
	· f.	Info for Facility Site ch	hange, Ref: POOGM lett	er of 29 November 196
4	g.	Instruction Book for Rota	atable Unidirectional	HF Antenna 237B-3
		with 2 prints for 437C-3	A Antenna.	
		a*		
TATINTL	h.	Data for Broad Band Dipol	le Antenna 437G-2A, Re	ef: POOGM letter
		of 1 December 1967.		
TATINTL	4.	As-Built Dwgs. for		_
			reference for existing	g primary power
		line, Ref: POOGM letter	of 15 December 1967.	
	j.	Memorandum for the Recor	d of the meeting held	on 11 January 1967
ATINTL		with	Ref: O	ur letter of

STA

- 16 January (Ref. No. C-16-68).
- Department of the Army Technical Manuals, TM5-811-1 and -2.

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- Applicable
- NEC 1965.
- IES Lighting Hand Book, 4th edition.

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Project	Transmitter		of17
Feature	Electrical Design Analysis	Designed M.I.	Date 18 Jan 1968
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III. DEBIGN RESUME:

Generally, five basic design pointers were considered in the electrical system layout such as safety capacity, flexibility, accessibility and reliability.

Circuit design vill conform to the requirements of the National Electrical Code.

Circuit loading is generally 20-ampere, 2-wire, 120-volt for lighting and receptables.

In all cases, leading of circuit will not exceed 80% of the branch circuit rating.

Branch circuits and feeders overcurrent protection will be rated 25% greater than the load rating, but shall not exceed 150% of the load.

Specific rules for fuse and circuit breaker setting and coordination of the National Electrical Code will be followed.

Basic limitations on voltage drop for this design will be:

3% for feeders or sub-feeders from transformer to lighting or power panelboards.

2% for branch circuits to lighting or power loads.

Motor circuits will be 2 & 3% of the above respectively.

The number of lighting and power branch circuits will be based on the final load requirements of the building.

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item	Design Analysis Summary	Checked	<u> </u>)ate

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Electric power will be derived from plug-in bus duct at 240 volts,
3-phase generators are GFM and will be wired for complete integration
with

Building utility load power will be 120/208 volts derived from a 150 KVA dry type transformer except for air conditioning equipment.

Grounding is a stringent requirement of this project. Design is prepared in accordance with the using service grounding requirements and the National Electrical Code.

There will be two separate grounding systems though it is realized that a single grounding source is generally always used for grounding both the system and equipment.

The building system neutral will be grounded at the power entrance cubicle located in the power room and tied to the transformer secondary ground.

All metal throughout the building such as reinforcing steel, steel cabinets, panelboards, antenna switches, hardware, cable shields, etc. will be physically bonded together and connected to the grounding grid or peripheral ground wire or indicated on the drawings.

Project Sheet Designed	A DDD70 00002A0	A000300010001-1			
Project		Sheet 6	of 17		
Feature		Designed	Date		
Item		Checked	Date		

ELECTRICAL DESIGN ANALYSIS

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TRANSMITTER BUILDING

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ELECT	RICAL DESIGN A	NALYSIS	Checked	Date		* T1 ,
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		LOAD & SERVICE	ANALYSIS		. *	s #
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SERVICE SIZES ARE DERIVED UNDER SERVICE SIZE ANALYSIS WHERE DISTANCE FROM THE TRANSFORMER STATION IS CONSIDERED IN CALCULATING SIZE.

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	EXHAUST FANS	360	1,00	360	ļ.,:	ļ
	RANGE	10,500	0.80	8,449		
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	HOT WATER HEATER	7,000	1,00	7,000		***************************************
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	WATER CHILLERS	9660				
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^{**} HEATING EQUIP DOES NOT RUN WHEN A/C UNIT ON.



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	GATE HOUSE	2000	1.0	2000		
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DRY TYPE INTERIOR DISTRIBUTION TRANSFORMER.

PRIMARY 240V, 3+3W, 60CPS SECONDARY 120/208V, 3+4W

TOTAL CONNECTED LOAD - 117.2 KVA

TOTAL DEMAND LOAD = 100.6 KVA DEMAND FACTOR = 0.86

MAXIMUM DEMAND LOAD = 100.6 KVA DIVERSITY FACTOR = 1.0

REFERENCE a.4.

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Project TRANSMITTER FEATURE EXTERIOR UTILITY	Decidence M. T. Date 15 JAN. 68
FEATHER EXTERIOR WITHIN	Checked Date

FLOODLIGHTING CALCULATIONS

CALCULATION FOR REQUIRED NUMBER & SIZE OF FLOODLIGHTS BASED ON "LUMENS IN THE BEAM" METHOD :

BEAM LUMENS REQUIRED = AREA IN SQ. FT. X FT. C. REQD X FACTOR FOR LIGHT

MAINTENANCE FACTOR

	BEAM	LUMENS	REQUI		TABI		
AREA	DESCRIPTION	AREA	FOOT X CANDLE X REQUIRED	LIGHT LOST FACTOR	MAINTENANCE FACTOR	ARE A LUMENS LECUINED	FLD. LGT. ANGLE REOUIREC
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(X) IES-NEMA TYPE

FL	OODL	IGHT		ATA	T	ABL			
DESCRIPTION	WATTS	BEAM	VERT. ANGLE TO 10%	HORIZ ANGLE TO 10%	LAMP LUMENS	BEAM EFF.	BEAM LUMENS	NO OF FLOOD- LIGHTS	F.C. MTD.
47078 SF AREA	300	TYPE 5 (*		960	5900	52.12	3015	28	1.02
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Project	Sheet	14	of	17	
Feature	Designed		Date		
Item	Checked		Date		

ELECTRICAL DESIGN ANALYSIS

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GATE HOUSE

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Project	KANSMITTER		_		
	GATE HOUSE		Designed	Date	
item	ELECTRICAL DESIGN ANALY	SIS	Checked	Date	an air
		LOAD & SERVICE	ANALYSIS		
	CONNECTED LOAD :	2.0	KVA		
	CONNECTED LOND.				
				7 A	
	MAX. DEMAND LOAD :	5,000	× /.0	2.0	K VA
		(CONN. LOAD)	DEMAND FAC	IUR)	

1.7

SERVICE: 120/208 VOLTS . 1 PHASE . 3 WIRE . 60 CYCLES

SERVICE SIZES ARE DERIVED UNDER SERVICE SIZE ANALYSIS WHERE DISTANCE FROM THE TRANSFORMER STATION IS CONSIDERED IN CALCULATING SIZE.

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The second secon	LOAD	SCHE				
ITEM	LOAD DESCRIPTION	VA	CEMAND FACTOR	DEMAND LOAL-VA		
PANEL	LIGH7S	850	1.0	850		agantan arabah
- meralife - zer - X	RECEPT	130	1.0	150		
- · a +	HEATER	1000	1.0	1000		
		2000	1.0	2000		
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TOTAL LUWENS X COEF X M F

REG'D F.C. X AREA

REGO LUMENS #